**BEFORE THE**
**PUBLIC SERVICE COMMISSION**
**OF SOUTH CAROLINA**

**DOCKET NO. 2018-3-E**

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| In the Matter of<br>Annual Review of Base Rates<br>for Fuel Costs for<br>Duke Energy Carolinas, LLC | )<br>)<br>)<br>)<br>) | **REBUTTAL TESTIMONY OF STEVEN D. CAPPS FOR DUKE ENERGY CAROLINAS, LLC** |

**Q. PLEASE STATE YOUR NAME, BUSINESS ADDRESS, AND CURRENT POSITION.**

A. My name is Steven D. Capps, I am the Senior Vice President of Nuclear Corporate and my business address is 526 South Church Street, Charlotte, North Carolina.

**Q. DID YOU PREVIOUSLY FILE DIRECT TESTIMONY IN THIS DOCKET?**

A. Yes, I filed direct testimony discussing the performance of Duke Energy Carolina's ("DEC" or the Company") nuclear fleet during the period of June 1, 2017 through May 31, 2018 (the "review period").

**Q. WHAT IS THE PURPOSE YOUR REBUTTAL TESTIMONY?**

A. The purpose of my rebuttal testimony is to respond to the testimony of Office of Regulatory Staff Witness Matthew P. Schellinger, II as it relates to the forced outage that occurred at Oconee Unit 3 ("Oconee 3") on July 24, 2017.

**Q. PLEASE DESCRIBE THE OUTAGE THAT OCCURRED AT OCONEE 3 THAT IS THE SUBJECT OF YOUR REBUTTAL TESTIMONY.**

A. On July 24, 2017, a Breaker Failure Relay at Oconee 3 was inadvertently actuated, which actuated Oconee 3's lockout relays and tripped two Power Circuit Breakers, resulting in the trip of Oconee Unit 3. The resulting forced outage lasted approximately 29.5 hours.

**Q. HOW DO YOU RESPOND TO WITNESS SCHELLINGER'S RECOMMENDATION THAT THE REPLACEMENT POWER COSTS ASSOCIATED WITH THE OUTAGE THAT OCCURRED AT OCONEE UNIT 3 SHOULD BE DISALLOWED?**

A. I disagree with Witness Schellinger's recommendation. There is no basis for a finding that DEC failed to make reasonable efforts to prevent the isolated event that caused the

outage. While this incident involved human error, the outage resulted from an isolated incident in which well-trained and seasoned employees made errors in judgment despite reasonable and prudent training and processes implemented by Company management. As described in my direct testimony, the Company's nuclear fleet significantly outperformed the statutory net capacity factor and exceeded the statutory requirement to make every reasonable effort to minimize fuel costs. Under the South Carolina fuel statute, that performance creates a presumption that we made every reasonable effort to minimize our fuel costs. Witness Schellinger's testimony offers no basis for overcoming that presumption.

**Q. HOW DO YOU RESPOND TO WITNESS SCHELLINGER'S ASSERTION THAT THE COMPANY INDICATED THE OUTAGE RESULTED FROM A LACK OF TRAINING BY THE COMPANY FOR TRANSMISSION PERSONNEL WORKING AROUND SINGLE POINT VULNERABILITIES WITHIN THE PLANT?**

A. In my opinion Witness Schellinger has based his conclusion on a misunderstanding of the entirety of the outage and does not take into account the broader context of the outage and decisions and events that led to the particular outage. The Company's investigation of the Oconee Unit 3 outage showed that it was primarily the result of a human error made by a technician who, despite being properly trained and having extensive experience, failed to fully utilize appropriate human performance tools that were available to him. The investigation also discussed additional training and coordination that might have contributed to the incident's prevention. However, the Company's identification of opportunities to improve its operations is part of the Company's ongoing

efforts for continual improvement and provides no basis for any finding that the plant operation was unreasonable or imprudent. To this point, it is significant that in the recent North Carolina Utilities Commission ("NCUC") order refusing to disallow the costs of replacement power for this outage (discussed below), the NCUC rejected the argument that there was some reasonable additional training or safety measure that would have prevented the human mistake that caused the Oconee 3 outage.

**Q. IN YOUR OPINION, WERE THE EMPLOYEES INVOLVED IN THIS INCIDENT ADEQUATELY TRAINED?**

A. Yes – in fact, I believe the employees involved in this incident were more than adequately trained to perform the tasks that led to this incident.

**Q. WAS THERE A HISTORY OF REPEATED ERROR OF THIS SORT?**

A. No. The Company does not have any history of repeated errors involving work in the switchyard and Witness Schellinger has made no such allegation. In fact, despite the countless maintenance tasks that occur on a recurring basis in the switchyard, there has not been another outage at a DEC nuclear plant involving switchyard interface issues in over a decade. I believe that a repeated error is a key indicator of whether the Company has taken reasonable steps to safeguard against error.

**Q. PLEASE ADDRESS THE CHALLENGES OF HUMAN ERROR IN THE CONTEXT OF NUCLEAR OPERATION AND MAINTENANCE ACTIVITIES.**

A. The operation and maintenance of nuclear units is an inherently complex and technical endeavor. The Company has established an organization comprised of hundreds of highly skilled and extensively trained technicians that, on a daily basis, execute and perform thousands of challenging technical tasks to ensure the safety and reliability of the

Company's nuclear fleet. While Company management puts structures and methodologies in place to guide and inform the performance of such tasks, it is ultimately the Company's personnel that must execute each task. And the "on the ground" reality is that humans will occasionally make errors in judgment despite even the most prudent and vigilant management efforts.

**Q. DOES THAT MEAN THAT DEC EXPECTS THAT FORCED OUTAGES CAUSED BY HUMAN ERROR WILL OCCUR?**

A. Absolutely not. We have and always will strive to achieve complete excellence in the operation and maintenance of our plants while also prioritizing safety above all.

**Q. WHAT PRACTICES HAVE BEEN PUT INTO PLACE TO PREVENT HUMAN ERRORS?**

A. The Nuclear and Transmission organizations fully realize the importance of human performance, and both organizations have formal human performance training curriculum. Human performance standards are reinforced and verified by formal peer and management observations. Lower level human performance challenges, often classified as "near misses," are aggressively reported, tracked, and shared across the organizations. Working with industry groups, both the Nuclear and the Transmission organizations leverage not only internal learnings, but learnings from across the industry. Procedures and processes are designed with a keen focus on identifying and mitigating human error traps.

**Q. WHAT EVIDENCE DID WITNESS SCHELLINGER PUT FORTH TO SUPPORT HIS CONCLUSION THAT THE REPLACEMENT POWER COSTS COULD HAVE BEEN AVOIDED?**

A. Witness Schellinger did not set forth any evidence to support his conclusion that replacement power costs could have been avoided. While Witness Schellinger states that he relied on his review of the Company's Apparent Cause Evaluation ("ACE") report, a review of the North Carolina Public Staff Testimony of Dustin R. Metz, discussions with NC Public Staff, and discussions with Company personnel, Witness Schellinger does not provide any specific evidence upon which his conclusion is based.

**Q. YOU INDICATED THAT WITNESS SCHELLINGER RELIED IN PART ON A REVIEW OF TESTIMONY IN A NORTH CAROLINA PROCEEDING. HAS THE NORTH CAROLINA UTILITIES COMMISSION MADE A RULING ON THE OCONEE UNIT 3 OUTAGE?**

A. Yes. On August 20, 2018 the NCUC released its order ruling on DEC fuel-related charges in Docket No. E-7, Sub 1163. In that order, the NCUC found that the replacement power costs associated with the Oconee Unit 3 outage "were reasonably and prudently incurred under efficient management and economic operations." (NCUC Order at p. 29.) The NCUC determined that "DEC implemented reasonable and adequate safety procedures to prevent the [relay technician's] mistakes that were made at Oconee, and that DEC's actions were prudent based on the information that DEC knew, or reasonably should have known, at the time." (NCUC Order at p. 28.)

**Q. Q. DID THE COMPANY'S INVESTIGATION OF THE OUTAGE CONCLUDE THAT THE EVENT WAS THE RESULT OF A FAILURE OF THE COMPANY TO TAKE REASONABLE EFFORTS TO OPERATE THE OCONEE 3 UNIT?**

No. To the contrary, the investigation supports my opinion that the outage was the result of an isolated human error and not the result of the Company's failure to take reasonable steps to properly operate the unit. The employees involved were given appropriate training, they had completed that training and they were qualified to be performing the tasks they were assigned.

**Q. HOW DID THE NUCLEAR ORGANIZATION RESPOND AFTER THE UNIT WAS TRIPPED?**

A. The Nuclear organization's response immediately following the onset of the outage was very good. Our personnel handled the incident seamlessly in accordance with established training and procedures and took the necessary immediate actions. After assessing the situation, the operators took prompt action to prepare the unit for a return to service and the unit was back online in less than 30 hours, thereby minimizing the replacement power costs arising from this outage.

**Q. PLEASE DESCRIBE THE OVERALL PERFORMANCE OF DEC'S NUCLEAR FLEET DURING THE REVIEW PERIOD.**

A. During 2017, DEC's seven nuclear units produced 62% of the total power generated by the Company and achieved a capacity factor of 95.87%, far exceeding the industry average of 88.76%[1] and marking the 18th consecutive year in which DEC's nuclear fleet achieved a system capacity factor in excess of 90%. The Catawba station established a

[1] Percentage taken from the most recently published North American Electric Reliability Council's ("NERC") Generating Unit Statistical Brochure ("NERC Brochure") for the period 2012 through 2016 for comparable units (pressurized water reactors on a capacity-rated basis with capacity ratings at and above 800 MWs)

new annual generation record during 2017, and the DEC nuclear fleet achieved the 2nd highest annual output in the Company's history.

**Q. TO WHAT DO YOU ATTRIBUTE SUCH EXEMPLARY PERFORMANCE?**

A. The Company has a dedicated and highly trained professional workforce. In the Nuclear organization, formal training programs are established and accredited by the INPO and the National Nuclear Accrediting Board. Technical nuclear workers receive, on average, between 80 and 275 hours of formal classroom or laboratory training annually, depending on function. Formal training qualifications are required for many tasks performed at the nuclear stations. When performance fails to meet expectations, the Nuclear organization completes rigorous self-critical investigations to identify enhancements to reduce and minimize future challenges. This self-critical assessment of performance builds the foundation of the skilled Nuclear organization. Every opportunity to learn from internal and external events is embraced as the Nuclear organization strives for continuous improvement. Similarly, in the Transmission organization, relay technicians attend a rigorous technical training program that includes a four year initial training program consisting of 200+ hours of classroom, online and field training annually. Relay technicians are also required to attend a minimum of 20 hours each year of continuing education to maintain and improve technical and human performance skills.

**Q. WHAT OTHER EVIDENCE DOES THE COMPANY HAVE TO DEMONSTRATE ITS EXEMPLARY PERFORMANCE?**

A. DEC's nuclear fleet is a recognized leader in both performance and efficiency. Based on industry benchmarking, DEC's nuclear fleet ranks among the top performers in the areas of personal safety, radiological dose, manual and automatic shutdowns, capacity factor,

forced loss rate, and total operating cost. Based on 2017 cost data from the Electric Utility Cost Group, all three of DEC's nuclear plants rank in the top quartile in total operating cost among the 60 U.S. operating nuclear plants.

**Q. WAS THE COMPANY'S MANAGEMENT OF ITS NUCLEAR FLEET DURING THE TEST PERIOD REASONABLE AND PRUDENT?**

A. Yes, the Company's management of its nuclear fleet during the test period was reasonable and prudent, as is demonstrated by operational metrics discussed above, and Witness Schellinger does not allege otherwise.

**Q. DOES THIS CONCLUDE YOUR REBUTTAL TESTIMONY?**

A. Yes.